Abstract

Continuous Stirred Tank Reactor (CSTR) plays an important role in the process industries. It helps for maintaining the temperature of the liquid in the reactors. This paper deals with the comparison of adaptive control and conventional PID control in CSTR process. In the adaptive control, Model Reference Adaptive Control (MRAC) and Self-Tuning Regulator (STR) methods are used. The Recursive Least-Square algorithm (RLS) gives the process parameters and Minimum Degree Pole Placement (MDPP) gives the controller parameters and is used to obtain the Control law. This paper illustrates how well the MDDP and RLS algorithms work. The S-function simulation is made using MATLAB codes and the results were analysed. Simulation results shows that the closed loop response of adaptive control has a better performance, compared with the conventional PID controller. This adaptive control method is applied to the Continuous Stirred Tank Reactor for maintaining the liquid temperature inside the reactor.
Optimization of a Temperature Control Loop using Self Tuning Regulator


**Index Terms**

Computer Science
Control Systems
Keywords
Continuous Stirred Tank Reactor  Model reference adaptive control  Minimum Degree Pole Placement
PID controller
Recursive Least-Square algorithm
Self-Tuning Regulator